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ABSTRACT

Designed to develop creativity in young learners, this book contains interdisciplinary activities which focus on the theme of nature. Activity pages are provided that can serve as front and back covers of a student booklet and the suggested activities can be duplicated for insertion between the covers resulting in a booklet for each student. A teacher/parent guide is included and supplies background information, activity descriptions, materials needed, and possible answers for the activities. A variety of exercises are provided on such topics as: (1) nature hikes; (2) weather, wind, and temperature; (3) clouds; (4) color in nature; (5) quadrant studies; (6) sounds in nature; (7) nature's cycles; (8) common trees, flowers, and plants; (9) animal tracks; (10) litter; and (11) feelings about nature. (ML)

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GOOD APPLE

YOUNG SCIENTISTS EXPLORE

Nature

BOOK 10 INTERMEDIATE LEVEL

ED280712

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YOUNG SCIENTISTS EXPLORE

NATURE

Book 10—Intermediate Level

by **Jerry DeBruin**

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Interdisciplinary Grid

illustrated by Jeane Swemba cover by Vanessa Filkins and Tom Sjoerdsma

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PREFACE
A NOTE TO TEACHERS AND PARENTS

Dear Friends,

Thank you for the many kind comments about my previous books, *Creative, Hands-on Science Experiences* (CHOSE) published by Good Apple, Inc., in 1980 and the first nine books in the *Young Scientists Explore* series published by Good Apple, Inc., in 1982, 1983 and 1985.

This book, *Young Scientists Explore Nature,* is written as a result of your comments and suggestions, comments that suggested a need for handy science books that contain activity sheets which could be duplicated for students' use. *Young Scientists Explore Nature* is an attempt to meet this need.

Young Scientists Explore Nature is the tenth in a series of books that features science activity sheets which provide youngsters with a variety of interesting and challenging indoor and outdoor "hands-on" science-related experiences, cutouts, rubbings, charts, and seek-a-words. Youngsters are encouraged to explore nature and gain firsthand experience while doing the activities, for it is through firsthand experience that meaningful learning occurs. Emphasis throughout the book is placed on the development of creativity in the learner. It is hoped that this creativity will be nurtured both during and after the activities are done.

You, as teachers and parents, are encouraged to make duplicating masters, copies and transparencies from the pages found in *Young Scientists Explore Nature.* The activities, complete with activity cards, are interdisciplinary and nonsequential in nature and are meant to integrate and extend existing science instruction with other academic areas. To achieve this purpose the book contains 24 two-part activity cards (question card at bottom of page, answer card in back of book) and a Teacher/Parent Guide that supplies background information, including the title, special tips and answers needed for each activity. When completed and mounted on single-layered cardboard and bound with tape, activity sheets 2 and 3 make up both the front and back covers of the Student Booklet. Completed student activity sheets can then be inserted between these covers or placed in a three-ring binder or file folder with the result being a permanent booklet for each youngster to take home. In addition, activity sheets can be stapled to single-layered cardboard and used as a Mini Nature Hike Sketch Pad described on page 4.

In addition to "hands-on" activity sheets, *Young Scientists Explore Nature* contains two matching activity cards per activity sheet that can be used for enrichment activities. The "A" lettered card found at the bottom of each activity sheet features an extending activity; the "B" lettered card found in the back of the book contains the answers or further background information. Teachers and parents are encouraged to have their youngsters cut out and mount the cards back-to-back on single-layered cardboard and laminate. This results in a handy set of 24 activity cards for each student to further his study of nature.

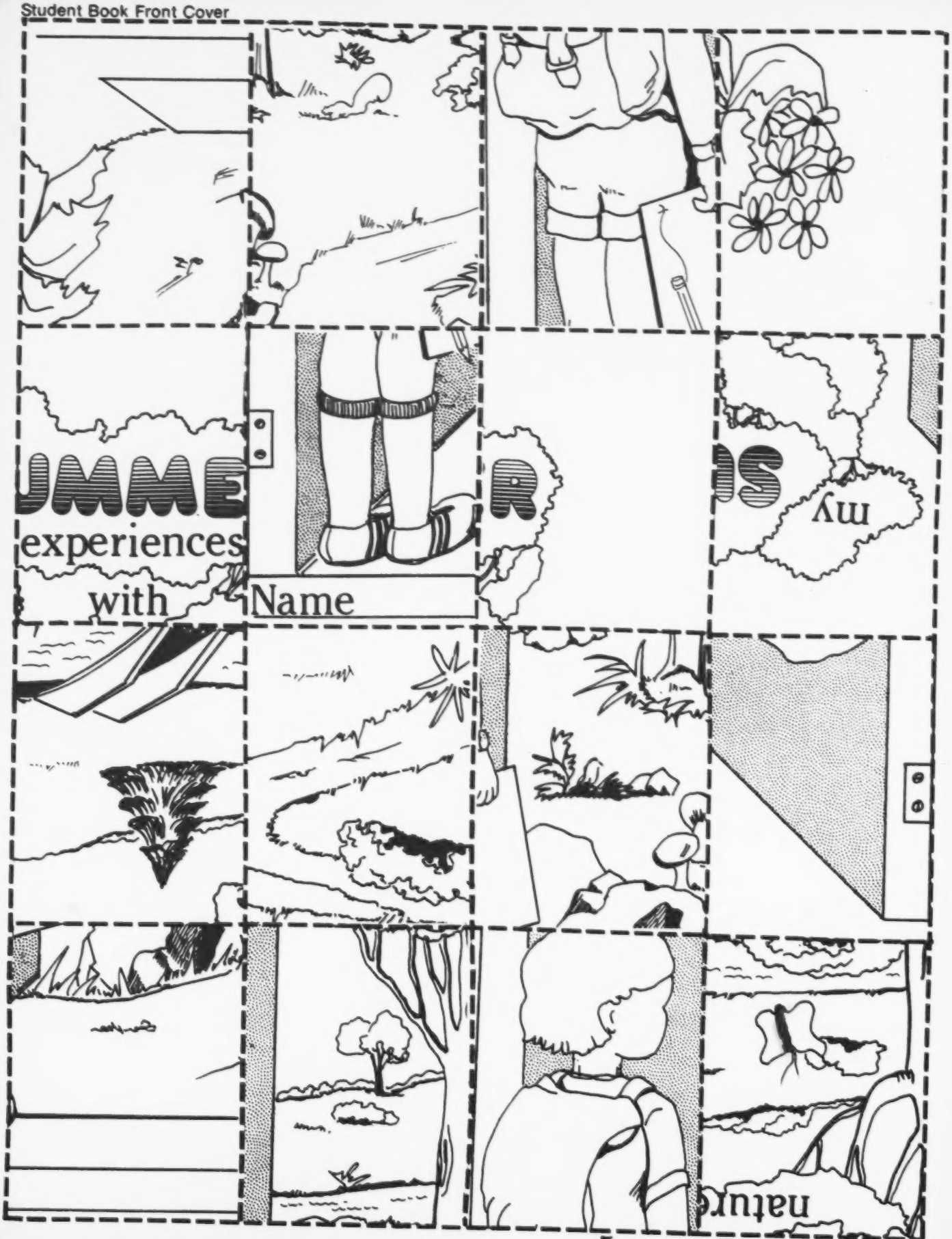
It is hoped that these activity sheets and related activity cards will touch many minds, hearts and hands and that much personal growth is experienced by all who do the activities. Keep in touch. Let me know how you are doing. It is always good to hear from you. Until then, best wishes in your continued growth as a scientist and as a complete human being.

Sincerely,

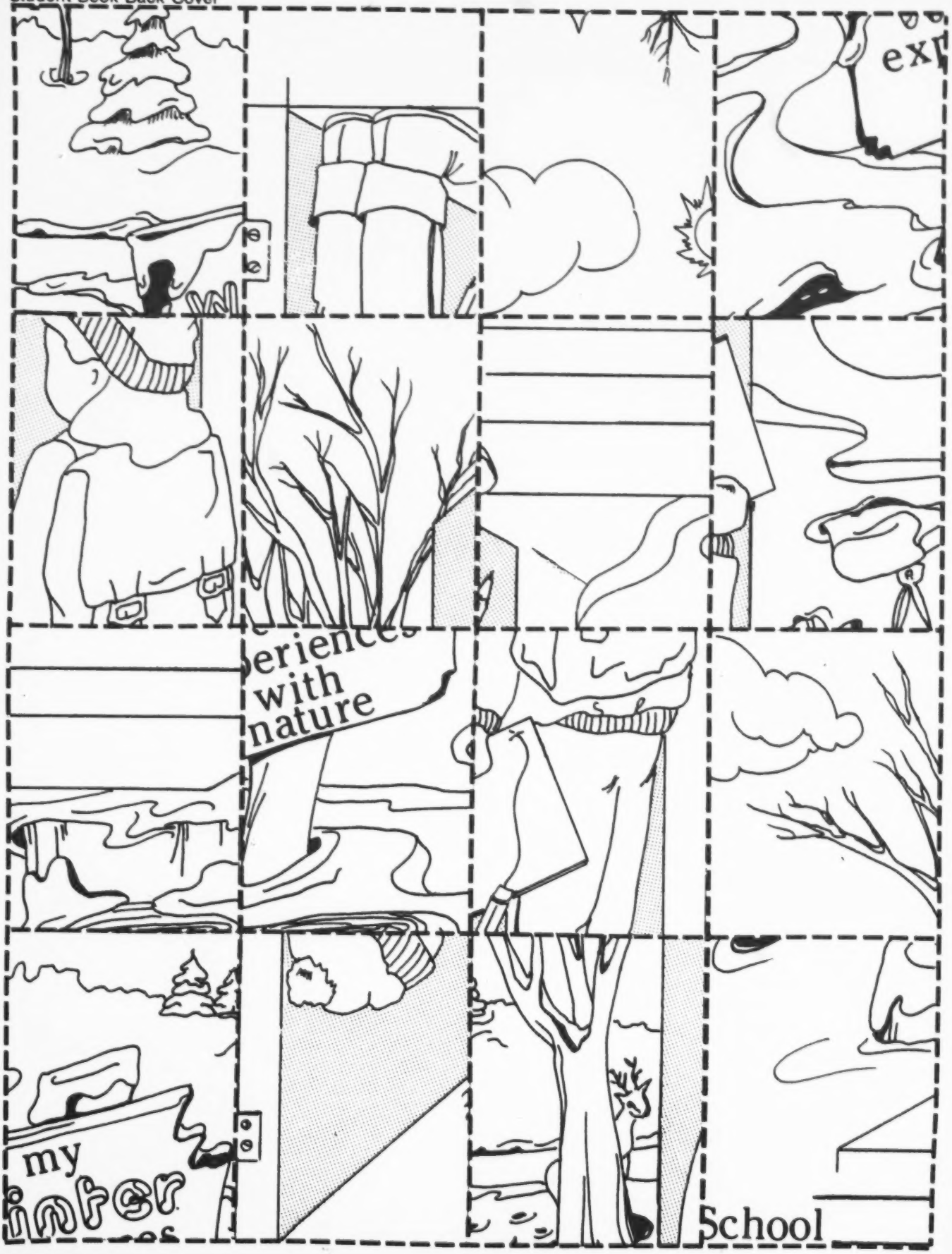
Jerry McBrien

P.S. The author thanks Mr. Paul Goff, Interpretive Specialist, Toledo Metroparks, Toledo, OH, the youngsters and teachers for their kind advice and helpful hints used in the writing of this book.

Student Book Front Cover

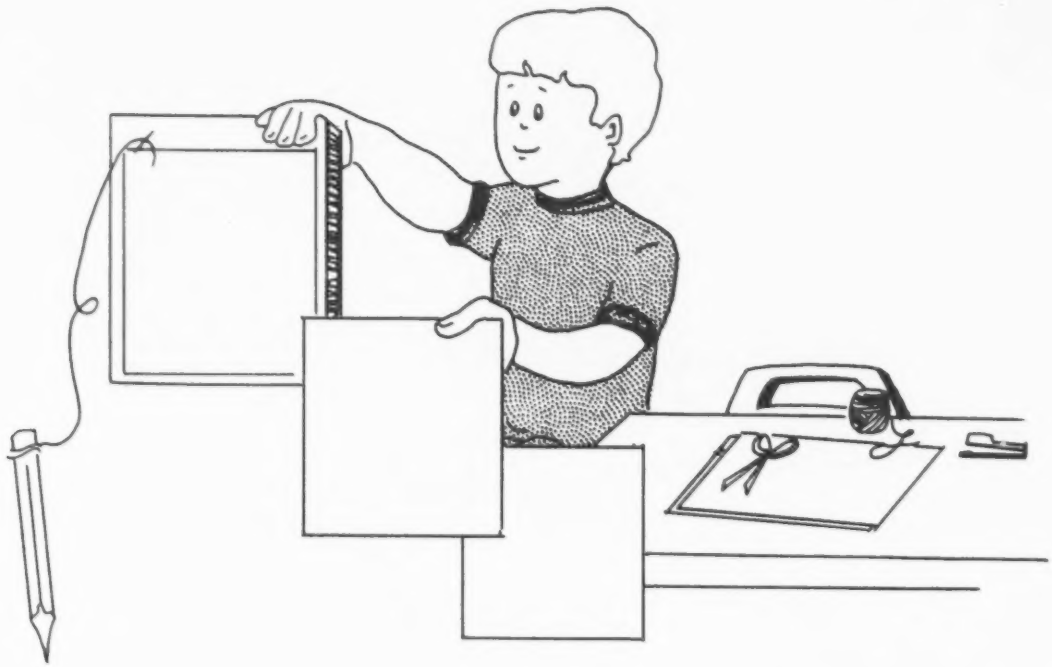


Student Book Back Cover



FOLLOW DIRECTIONS

Begin your study of nature by making a mini nature hike sketch pad. You will need a 9" (23 cm) x 12" (30 cm) sheet of single, double or triple-wall cardboard, a 20" (51 cm) length of string, pencil, stapler, and copies of pages found in this book. Staple the string and the pages to the upper left corner of the cardboard. Tie pencil to end of string. You are now ready to record information about nature on the pages attached to your mini nature hike sketch pad.

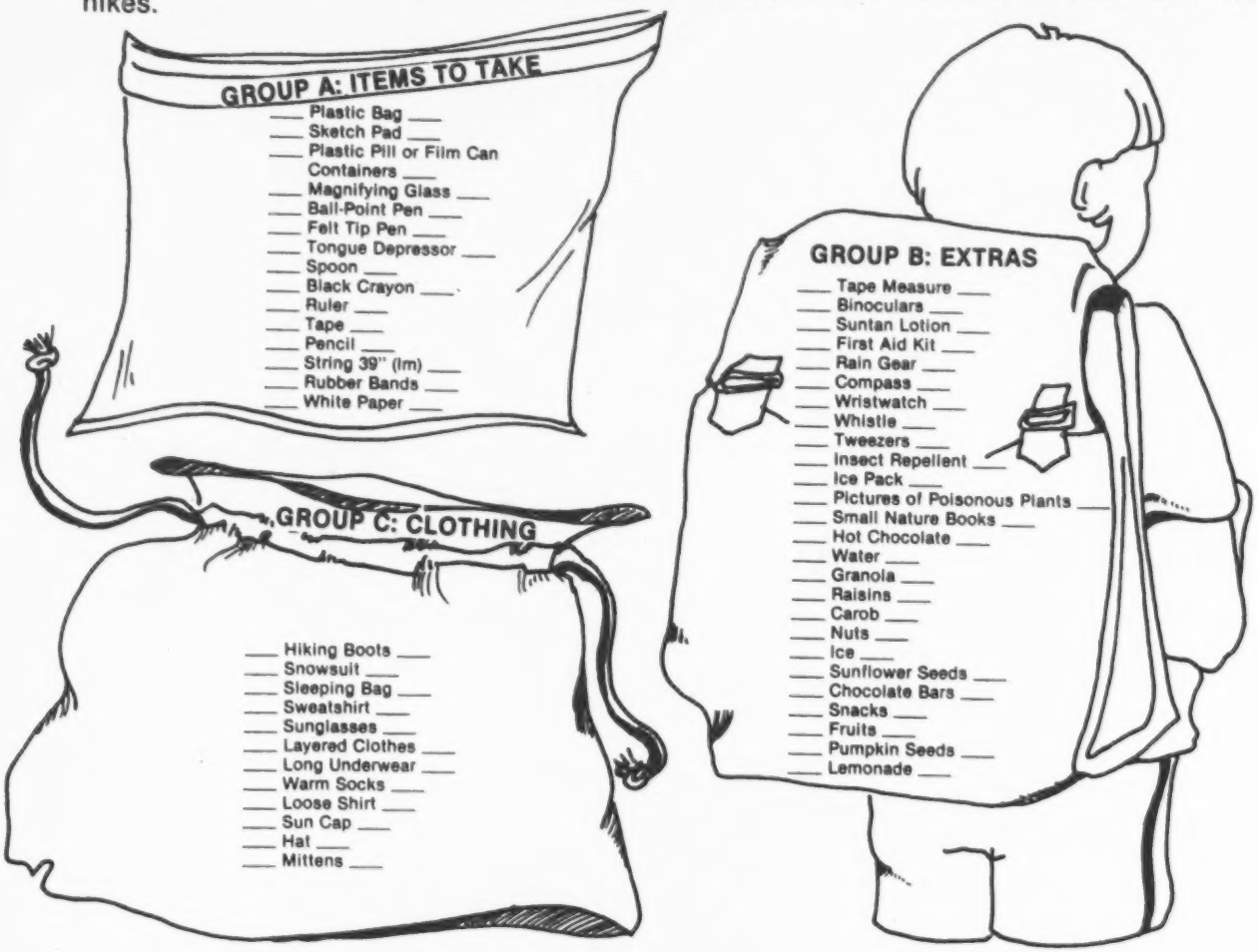


What is this instrument? **4A**

Ask your teacher/parents for answer card **4B.** Check your answer. Glue or tape answer card **4B** to back of question card **4A.** Save cards. Make a deck of question/answer cards of nature activities.

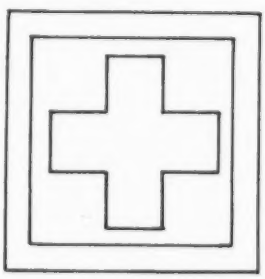
Nature Hike Study Kit

Before you begin your nature hike, collect and store the items listed in group A below in a 10" (25 cm) x 14" (35 cm) plastic bag. Depending on the time of the year, you and your teacher should take along items listed in group B in an old lunch pail, small shoulder bag or canvas carrier. Group C features a list of possible clothes to wear. Put a check (✓) mark in the blank before the word as each item used on a summer hike, a "W" for a winter hike item, an "SW" for both summer and winter hikes.



What is this symbol? **5A**

COLOR THE CROSS RED



What are some items that should be included in a nature hike first aid kit?

Ask your teacher/parents for answer card **5B**. Check your answer. Glue or tape answer card **5B** to back of question card **5A**. Save cards. Make a deck of question/answer cards of nature activities.

Tips on Taking a Hike

A hike through nature can help you capture the magic of a forest, pond, beach, meadow or even your own backyard. Use and extend all your senses while on a hike. Below are pictures that show five of seventeen senses: seeing, hearing, tasting, smelling and feeling. Write the number of the tip on the picture of the sense that matches the description of the tip given for that sense. Then, explore nature by using all your senses.

SENSES

TIPS

1. Seeing is more than just looking. When you see, you search for pattern, movement and color. You note how things are lighted. You look for reflections and shadows. With a pen or pencil, draw what you see. Be sure to look at an object through cupped hands, a hand lens or a piece of cardboard with a pinhole in it.

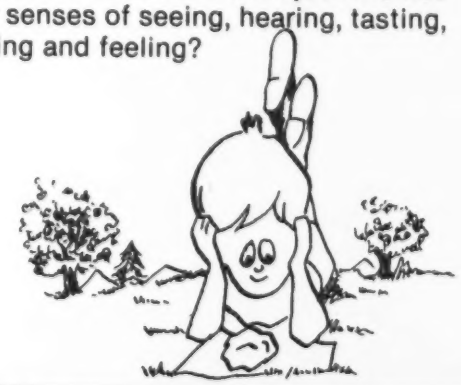
2. Talking may help or hurt your ability to see things. Noise often prevents us from seeing things and sometimes scares creatures away. Listen carefully to a bird's song, the snap of a twig, the whisper of the wind and the bubbling of water. Look and experience first; talk later.

3. Try to smell things that you've never smelled before. Have you seen, crushed in your fingers, and sniffed a piece of decaying bark or the stem of a sassafras leaf? This will help you become sensitive to the excitement and wonder in the world of nature around you.

4. Nature provides us with many tasty foods to eat. Remember, however, you should **never** eat any wild foods without your teacher or parents' permission. Eat only those foods found in your nature hike kit bag.

5. With permission from an adult, feel and collect some small specimens and samples such as soil, rocks, grass, bark, and leaves. Label all samples as you collect them. Collect only small amounts. Keep the natural environment as natural as possible.

Are there more senses than just the five major senses of seeing, hearing, tasting, smelling and feeling? **6A**



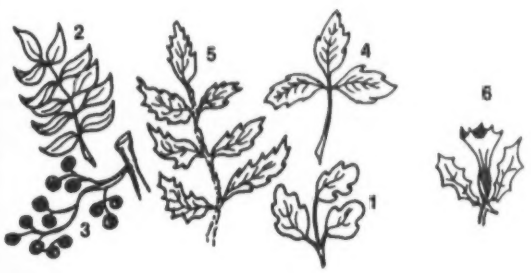
Ask your teacher/parents for answer card **6B.** Check your answer. Glue or tape answer card **6B** to back of question card **6A.** Save cards. Make a deck of question/answer cards of nature activities.

Be Aware of Nature's Special Safety Aids

Be safe on your nature hike. Check (✓) the acorn if you feel the statement is a wise safety tip, (X) if unwise. Then, interview a naturalist to find out if your results are correct.

- Always hike with one or more friends.
- Hike only in places where you are welcome.
- Look where you step, especially for danger spots such as old wells and steep drops in rock ledges.
- Do not eat strange berries, leaves or other wild foods without permission from your teacher or parents.
- Do not touch clothes, another person or animals that have touched poison ivy until these are all washed in hot soapy water using yellow laundry soap.
- Do not explore a cave alone.
- Stay on open tracks and paths. Avoid places where poisonous snakes, scorpions and spiders are known to live.
- Get permission to hike over farm fields and woodlands.
- If you want to cook on a hike, find a campground or picnic spot where campfires are permitted.
- Be aware of, and stay away from, thin ice on a pond or stream.
- Check yourself and others for frostbite or sunburn.
- Dress warm in cold climates and cool in hot climates.
- Do not explore snowdrift tunnels.
- Do not walk under trees whose branches are covered with heavy snow.
- Be aware of mudslides and quicksand.
- Wear shoes or hiking boots at all times when hiking.
- Leave hiking areas undisturbed and cleaner than you found them.

What are these plants that you should stay away from while on a nature hike? **7A**



Ask your teacher/parents for answer card **7B.** Check your answers. Glue or tape answer card **7B** to back of question card **7A.** Save cards. Make a deck of question/answer cards of nature activities.

Getting Started With . . .

On the clocks below, draw hands to show the correct start and finish times for your nature hike. Record, in hours and minutes, how long you were gone on your hike.

Start Hike Time_____ a.m., p.m.
End Hike Time_____ a.m., p.m.
Total Hike Time_____ Hours
_____ Minutes

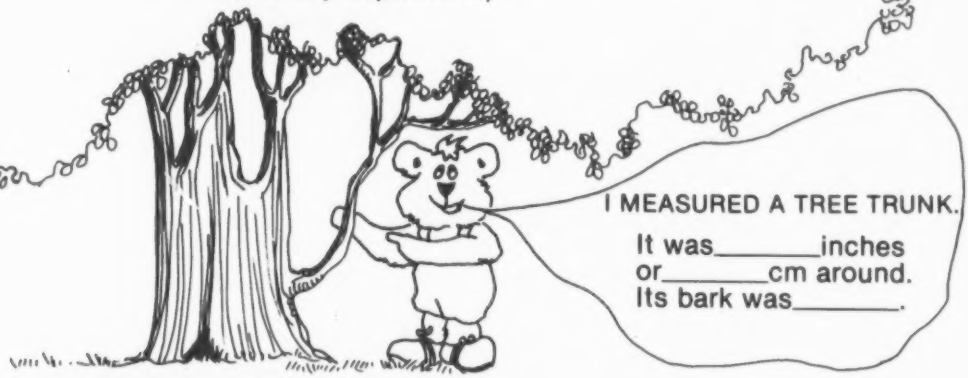
Trees grow upward from the top. Start at the top of the tree and fill in the blanks with information about your nature hike.

Today,_____ 19____, I went on a nature hike to _____.
(location)

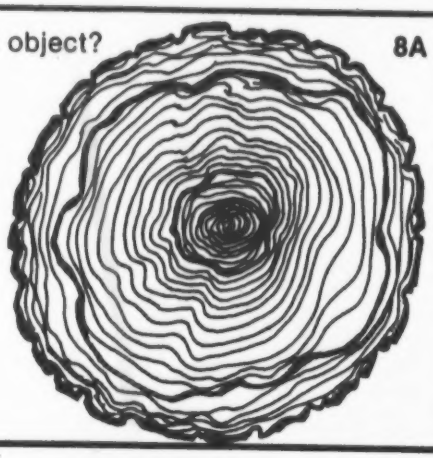
I went with _____.
(names of people)

My best experience on the nature hike was when . . .

_____.
(identify experience)



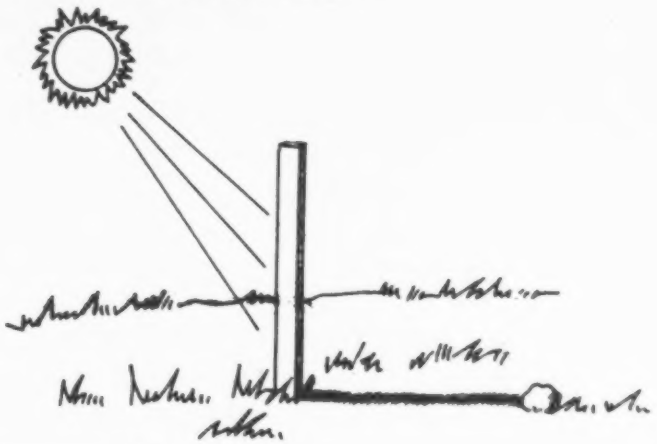
What is this object? **8A**



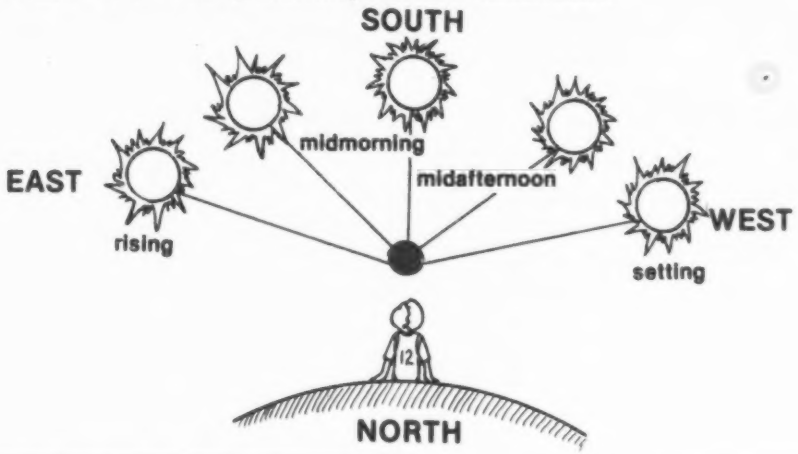
Ask your teacher/parents for answer card **8B.** Check your answer. Glue or tape answer card **8B** to back of question card **8A.** Save cards. Make a deck of question/answer cards of nature activities.

THE SUN

Do not look directly at the sun but **do** observe shadows cast by objects in the path of the sun. Place stick in ground. Observe shadow cast by the stick. Put a pebble at the end of the shadow. Measure the length of the shadow. Fill in the blanks below.



The time is_____a.m. or_____p.m.
The sun is located in the (east, west, north, south)_____.
The shadow cast by the stick is_____inches (____cm) long.
The shadow cast by the stick 30 minutes later is_____inches (____ cm) long.
The shadow is (long, short) in early morning and late afternoon.



9A

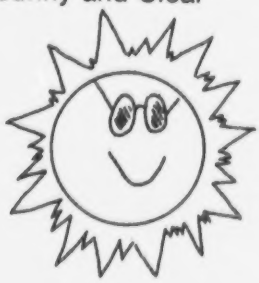
What is this monument?

Ask your teacher/parents for answer card **9B.** Check your answer. Glue or tape answer card **9B** to back of question card **9A.** Save cards. Make a deck of question/answer cards of nature activities.

THE WEATHER

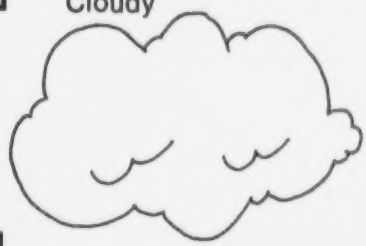
Check (✓) the box next to the word and picture that **best** describes the type of weather you had while on your nature hike.

☐ Sunny and Clear

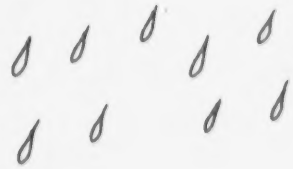


☐ Partly Cloudy

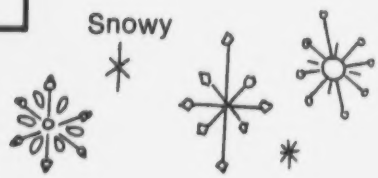
☐ Cloudy



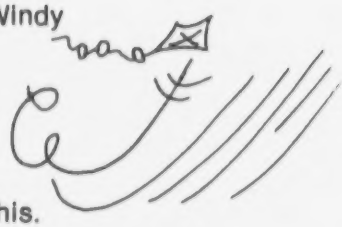
☐ Rainy



☐ Snowy



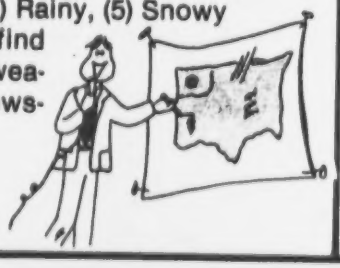
☐ Windy



Draw an animal made from a cloud here. One might look like this.

Meteorologists are people who study the weather. You too can be a meteorologist. Draw the symbols meteorologists use when they identify the following types of weather: (1) Sunny and clear, (2) Partly Cloudy, (3) Cloudy, (4) Rainy, (5) Snowy and (6) Windy. Then, find these symbols on a weather map in your newspaper.

10A

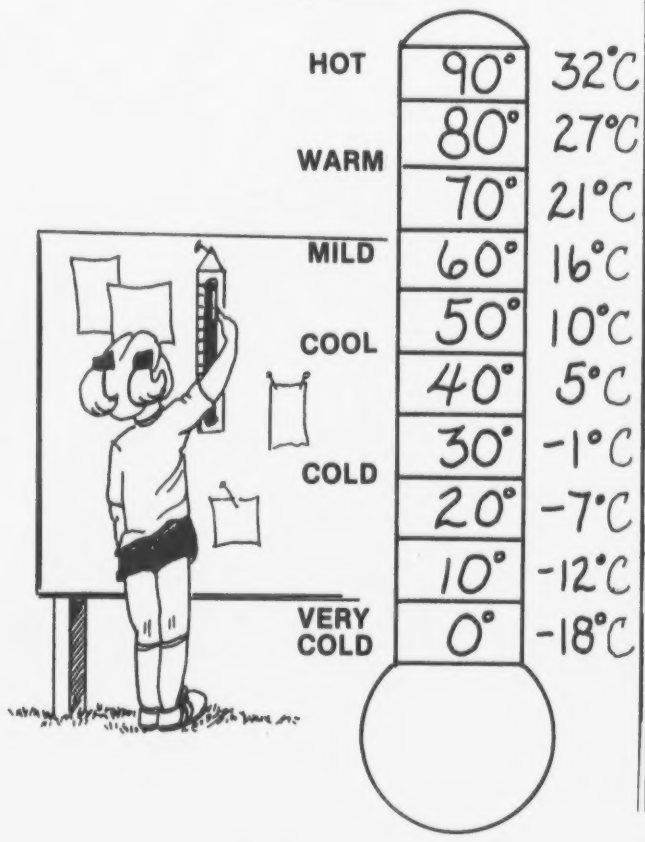


Ask your teacher/parents for answer card **10B**. Check your answer. Glue or tape answer card **10B** to back of question card **10A**. Save cards. Make a deck of question/answer cards of nature activities.

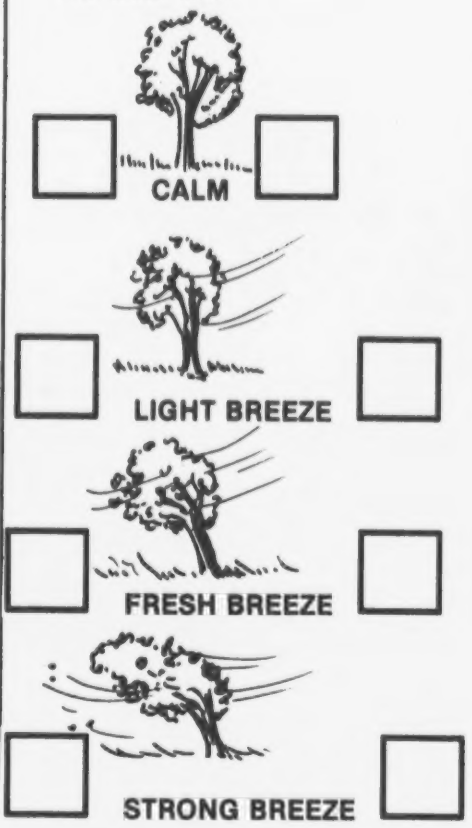
Wind and Temperature

With a pencil, shade in the day's temperature on the temperature scale below. Then, check the box in front of the word that shows how the wind was blowing on your nature hike. Using answer card **11B**, write the Beaufort Scale number in the box to the right of the word that describes the action of the wind.

The temperature was:



The wind was:



Your knowledge of sports can help you find the temperature in degrees Fahrenheit if you know the Celsius temperature. Follow these steps: **11A**

1. Multiply °C by the number of players on a baseball team.
2. Divide that number by the number of players on a basketball team.
3. Add 32. This gives you the temperature in °F.

Example: If 10°C is the known temperature, then:

(1) 10°C x 9 = 90
(2) 90 ÷ 5 = 18
(3) 18 + 32 = 50°F

Turn to card **11B**, the Beaufort Scale, for wind speed.

Ask your teacher/parents for answer card **11B.** Check your answer. Glue or tape answer card **11B** to back of question card **11A.** Save cards. Make a deck of question/answer cards of nature activities.

THE CLOUDS

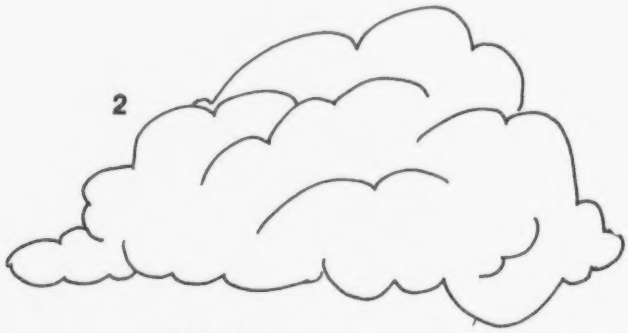
Look to the sky while on your nature hike. In the space below, write a complete sentence that describes the clouds in the sky. Below each picture, unscramble the letters to discover the name for each type of cloud. Then, fill in the blank below each cloud with the name of an object found hidden in each cloud.

My sentence: _____

1

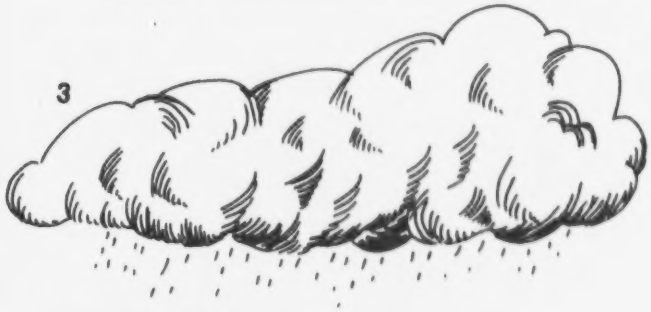
RICSUR_____
OBJECT _____

2



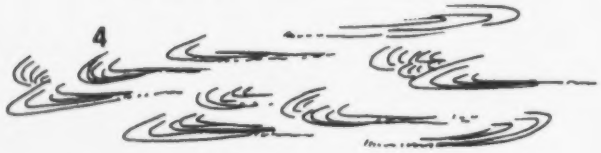
MUCUSUL _____
OBJECT _____

3



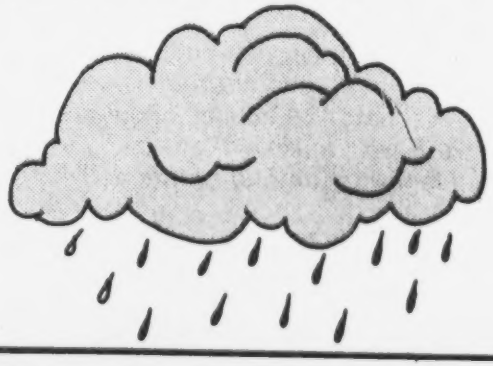
MINUBS _____
OBJECT _____

4



RASTUTS _____
OBJECT _____

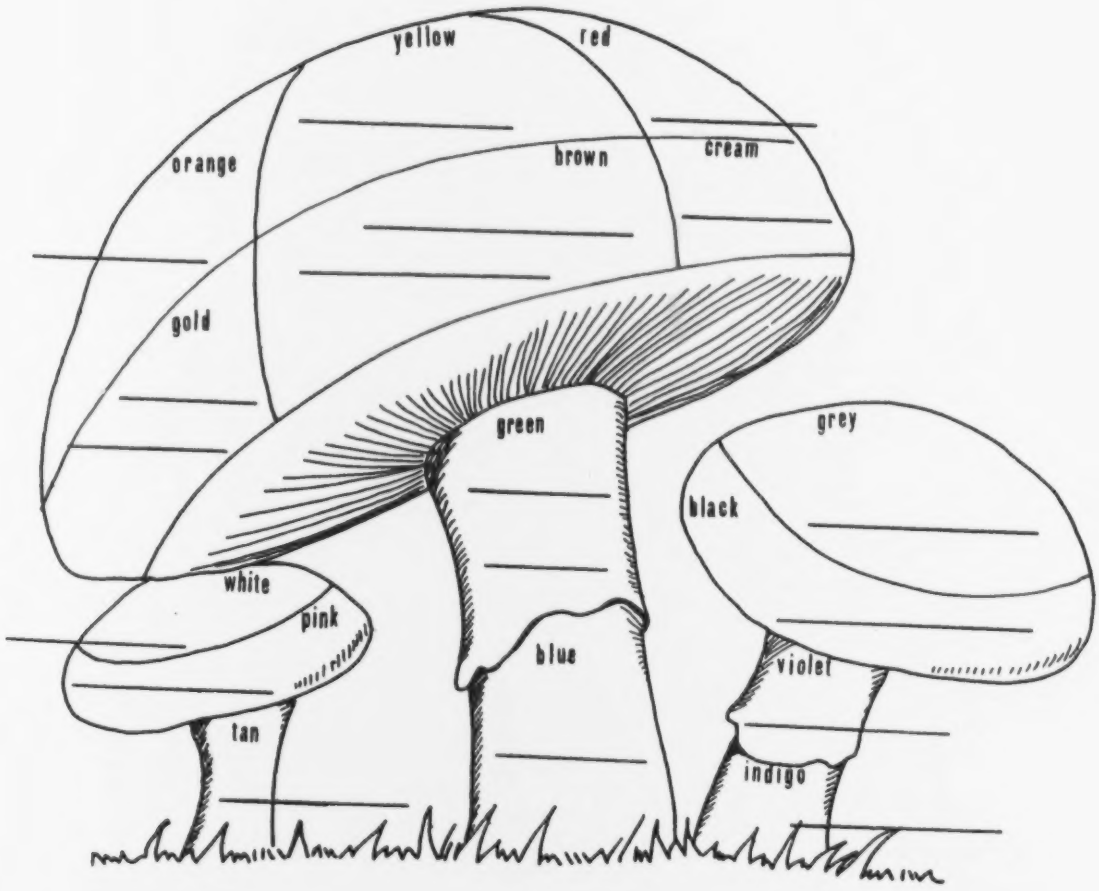
What are acid clouds? Why is "acid rain" dangerous to our environment? **12A**



Ask your teacher/parents for answer card **12B.** Check your answer. Glue or tape answer card **12B** to back of question card **12A.** Save cards. Make a deck of question/answer cards of nature activities.

Nature's Colors

STOP! Without moving another step on your hike, recite to yourself how many different colors and shades of colors you see in nature. Then, in the blanks below, list the names of nature's creatures that have those colors. Lightly color over the name of each object with its matching color.



13A

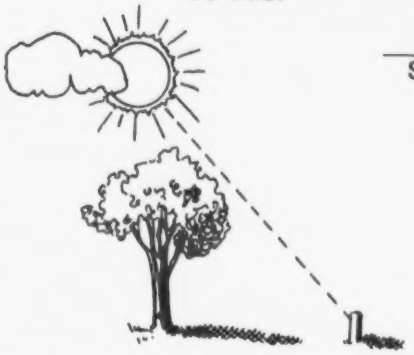
How can I change nature's colors? Color the leaf below green to show its summer color. Stare at the green leaf for 45 seconds. Shift your eyes to a white piece of paper. What color is the leaf now? What season does this color represent? What tree did this leaf come from? On answer card **13B** color the leaf the same color that you saw while staring at the white paper.

Ask your teacher/parents for answer card **13B.** Check your answer. Glue or tape answer card **13B** to back of question card **13A.** Save card. Make a deck of question/answer cards of nature activities.

Nature's Measurements

While on your hike, use a stick or your thumb to measure the height of a tree. For the stick method, you will need a pencil, tape measure, ruler and a stick.

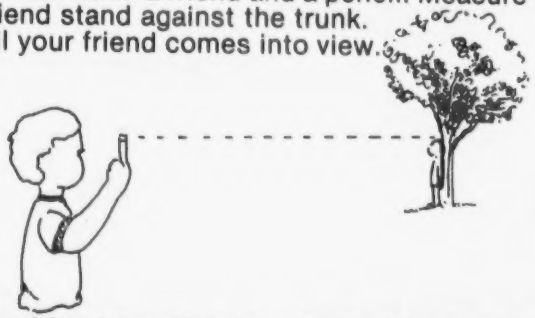
Measure length of stick (9") (22.5 cm) and drive into ground so 6" (15 cm) shows. Measure length of shadow cast by stick (10") (25 cm) and tree 360" (900 cm). Then, do this:



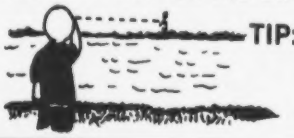
$$\frac{\text{Length of stick}}{\text{Stick shadow length}} = \frac{\text{Height of tree}}{\text{Shadow of tree}}$$

Therefore, customary (in.)	Metric (cm)
$\frac{6''}{10''} = \frac{x}{360}$	$\frac{15\text{ cm}}{25\text{ cm}} = \frac{x\text{ cm}}{900\text{ cm}}$
$10x = 2160''$	$25x = 13{,}500$
$x = 216''$	$x = 540\text{ cm}$
Height of tree = 216 in. or 18 ft.	Height of tree = 540 cm or 5.4m

To measure the height of a tree with your thumb, you will need a friend and a pencil. Measure height of your friend (60") or (152 cm). Have your friend stand against the trunk. Hold pencil vertically. Slide thumb down pencil until your friend comes into view. This is 5 feet (152 cm). Now, move pencil upward counting each 5 feet (152 cm). If you moved the pencil upward four times including the person, the tree would be 20 feet (608 cm) tall.



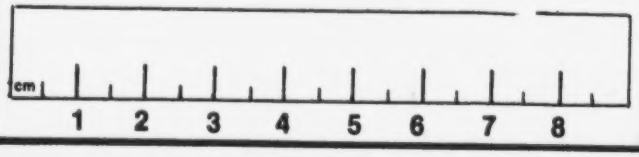
You can even measure the distance across a stream without crossing the stream. Place right hand to forehead to salute style until bottom of little finger appears to come in contact with opposite bank. Turn 90°, holding a steady position. Have friend walk away from you. Tell friend to stop walking when out of your field of vision. Measure this distance with your tape measure. This is the approximate distance across the stream.



TIP: If a bridge is nearby, walk across the bridge and measure this distance which is the distance across the stream.

14A

Write the symbols for these terms for length used in the metric system of measurement: millimeter, centimeter, decimeter, meter, dekameter, hectometer and kilometer. Then, find a twig on the ground. Place the twig on the metric ruler below. Make a mark on the ruler that shows the end of the twig. Record the length of the twig here. ☐ cm



Ask your teacher/parents for answer card **14B.** Check your answer. Glue or tape answer card **14B** to back of question card **14A.** Save cards. Make a deck of question/answer cards of nature activities.

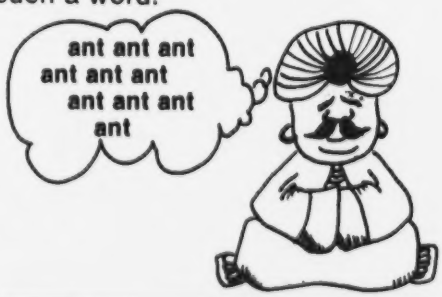
Stake Your Micro-Claim to Nature

You will need four sticks, a 39" (1 m) length of string, a magnifying glass and a pencil to stake your micro-claim to nature. Using the string, stake out a square yard (meter) of land. Push sticks upright into ground at the corners. Lie down on your stomach, keeping eyes no more than 1 foot (30 cm) off the ground. Observe your micro-claim of land carefully. Use a magnifying glass. Make a list of all the things you find in the one square yard (meter) of land. Classify these things into groups of living and nonliving creatures. Turn over on your back with your head inside the plotted area of ground. Pretend your claim extends high into the sky. How has your view changed? Quietly think about this experience. P.S. Remember to stake your claim during each of the four seasons and make a record of how it has changed over time.

Living

Nonliving

Can you think of a word that stands for a number of living things that occupy a home in nature? The person below is thinking of such a word. **15A**



Ask your teacher/parents for answer card **15B.** Check your answer. Glue or tape answer card **15B** to back of question card **15A.** Save cards. Make a deck of question/answer cards of nature activities.

Communicating with Nature

You communicate with nature and nature communicates with you but only if you observe and listen carefully.

During a 20-minute time period, cross off a number for each time you communicate with a **person** on your nature hike.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

During a 20-minute time period, cross off a number for each time you communicate with an **object** in nature on your nature hike.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

During a 20-minute time period, cross off a number for each time you feel:

smiley	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
lost	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
warm	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
cold	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
hot	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
shivery	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
sweaty	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
alone	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
talkative	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
silent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
curious	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
excited	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
trusting	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

What Moss Never Tells **16A**

A father explores nature with his nine-year-old son on a nature hike. When they reach a grassy area the father says, "Life is interesting and challenging. Sometimes though, things don't happen like I expect them to happen. It's during these times that I feel I have to talk to someone about what's going on. Son, what do you do during these times?"

Ask your teacher/parents for answer card **16B.** Check your answer. Glue or tape answer card **16B** to back of question card **16A.** Save cards. Make a deck of question/answer cards of nature activities.

Listening to Nature

While on your nature hike, take time to lie on your back and listen to nature. With your eyes closed and fist raised in the air, lift one finger for every sound that you hear. Make a list of these sounds below. Then, write the names of the sounds in alphabetical order. Use the first word of each sound to alphabetize the sounds.

Nature's Sounds

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Alphabetical List of Nature's Sounds

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

What sounds are humans capable of hearing? **17A**

Ask your teacher/parents for answer card **17B.** Check your answer. Glue or tape answer card **17B** to back of question card **17A.** Save cards. Make a deck of question/answer cards of nature activities.

Nature's Inventions

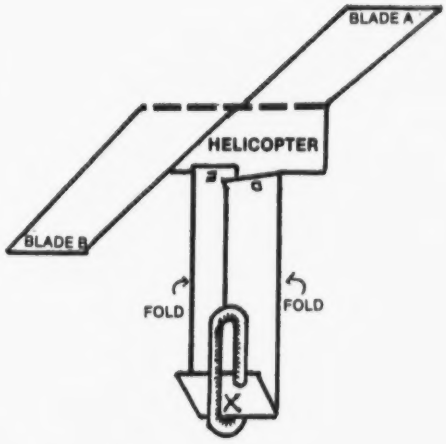
While on your nature hike, take a moment to sit down in a quiet place. Think about how, by studying nature's creatures, we have discovered many new inventions and activities. In the blank, write the letter of the creature that best matches the invention or activity. See card 18B for directions on how to make your own invention.

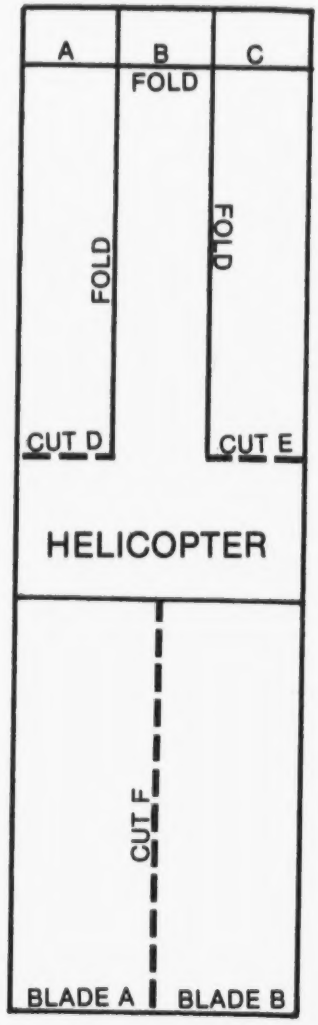
CREATURE

A. frog
B. maple seed
C. fish
D. seal
E. flea
F. water strider
G. penguin
H. salmon
I. whale
J. cheetah

INVENTION ACTIVITY

1. ____helicopter
2. ____broad jump
3. ____water skiing
4. ____pole vault
5. ____submarine
6. ____water ballet
7. ____100 meter dash
8. ____rocket propulsion
9. ____modern dance
10. ____swimming (breast stroke)





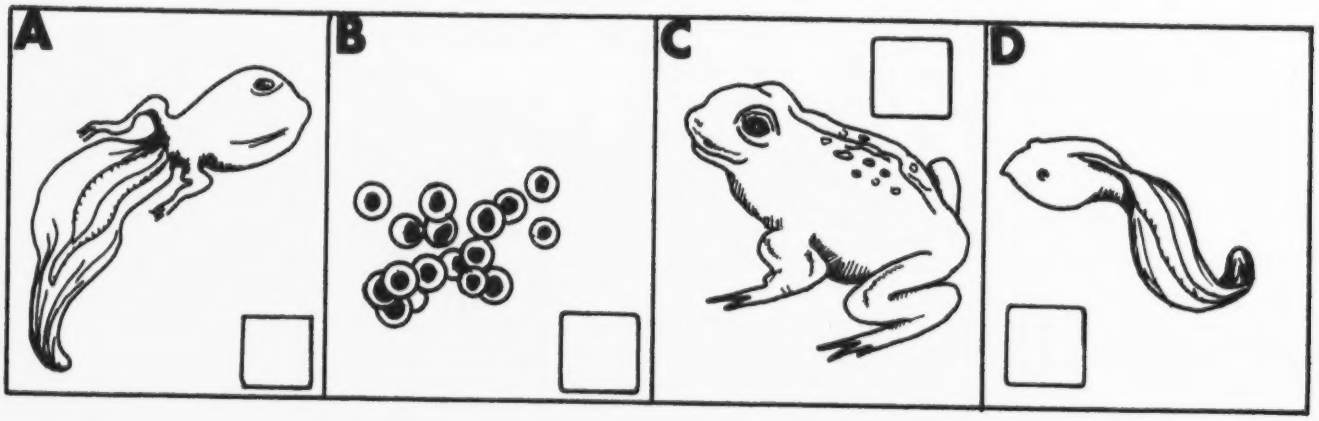
What is the name of this seed? **18A**

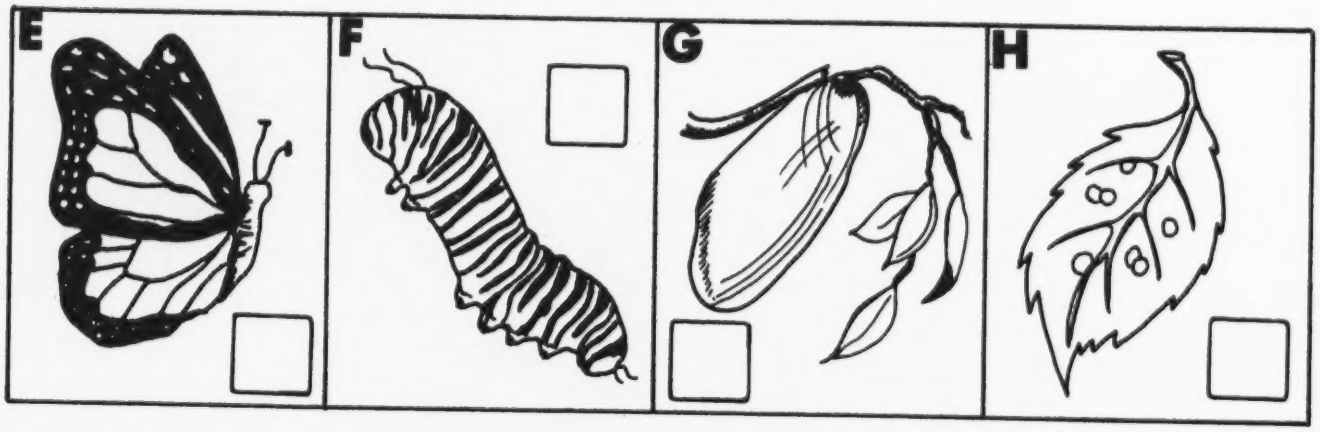
Ask your teacher/parents for answer card **18B.** Check your answer. Glue or tape answer card **18B** to back of question card **18A.** Save cards. Make a deck of question/answer cards of nature activities.

21

Nature's Cycles

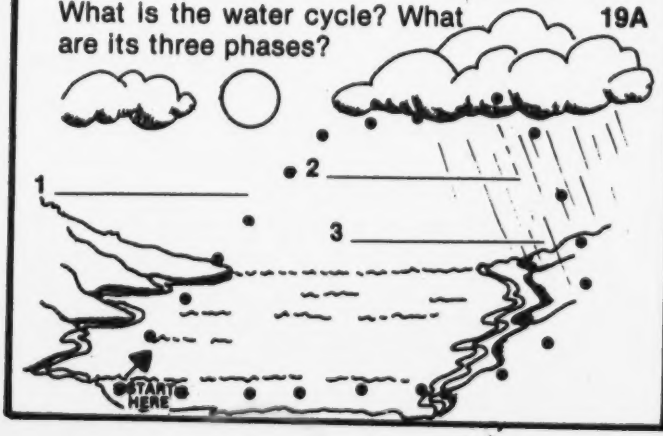
Nature's creatures change from day to day. While on your nature hike you may see some things that change as they grow. Number the boxes below according to the age of nature's creatures. Number one is the youngest; number four is the oldest. Then cut out, color and put the frog and butterfly cards in order from youngest to oldest.





What is the water cycle? What are its three phases?

19A



Ask your teacher/parents for answer card **19B.** Check your answer. Glue or tape answer card **19B** to back of question card **19A.** Save cards. Make a deck of question/answer cards of nature activities.

Trees, Flowers and Other Plants

Listed below are the names of some common trees, flowers and plants. Circle each one that you find while on your nature hike. Then, find the name of each in the puzzle below. The words are written forwards, backwards, diagonally, or vertically.

WORDS TO CHOOSE FROM:
Aster, Beech, Birch, Cacti, Chestnut, Crab Apple, Daisy, Dogwood, Elm, Fir, Goldenrod, Hemlock, Ironwood, Jade Plant, Lichen, Locust, Maple, Mayapple, Moss, Mushroom, Pine, Red Oak, Sassafras, Scouring Rush, Spicebush, Spruce, Trillium, Tulip Tree, White Oak, Wild Cherry, Willow

A	O	K	G	O	L	D	E	N	R	O	D	Q	B	I	R	C	H	E	X
C	R	A	B	A	P	P	L	E	F	H	W	V	U	E	S	P	F	B	B
V	H	P	H	U	I	L	N	G	U	T	I	U	K	L	E	R	W	Y	A
S	B	E	N	S	N	T	T	R	I	L	L	I	U	M	N	C	D	M	T
P	J	N	S	E	E	J	K	G	G	L	L	I	R	F	E	N	H	U	F
I	R	M	S	T	Y	Z	A	H	I	P	O	W	L	O	F	R	O	S	S
C	K	A	C	R	N	U	T	D	O	G	W	O	O	D	N	U	L	H	D
E	R	Y	U	F	F	U	L	L	E	A	K	F	C	A	A	W	X	R	S
B	J	A	C	H	I	U	T	N	E	P	U	L	B	I	E	I	O	O	L
U	P	P	R	S	U	R	L	M	C	A	L	R	U	T	A	L	T	O	N
S	T	P	C	O	S	A	S	S	A	F	R	A	S	A	I	D	O	M	D
H	U	L	H	H	N	Q	I	S	F	J	T	F	N	S	F	C	R	S	W
W	L	E	R	M	O	S	S	S	P	P	C	A	C	T	I	H	I	S	H
C	I	T	R	A	L	K	O	P	E	L	I	C	H	E	N	E	L	T	I
O	P	T	W	P	I	R	Q	R	E	D	O	A	K	R	U	R	U	S	T
H	T	J	A	L	W	C	A	U	T	M	L	C	M	O	R	R	N	L	E
C	R	K	H	E	M	L	O	C	K	A	L	T	U	L	R	Y	R	S	O
T	E	F	L	G	T	I	A	E	T	P	D	A	I	S	Y	I	N	R	A
C	E	S	C	O	U	R	I	N	G	R	U	S	H	C	T	U	L	E	K

Some people use memory devices to learn the names of trees. Here's one such device: (1) S is for spruce, S is for square; therefore spruce needles are square and can be rolled in your fingers (2) F is for fir, F is for flat; therefore fir needles are flat; (3) P is for pine, P is for packet; therefore pine needles come in packets of 2-5; and (4) H is for hem. Hem rhymes with stem. H is for hemlock; therefore hemlock needles have a stem at the base of each.

Why do leaves change colors? **20A**

Ask your teacher/parents for answer card **20B.** Check your answer. Glue or tape answer card **20B** to back of question card **20A.** Save cards. Make a deck of question/answer cards of nature activities.

Animal Creatures

Put a (✓) mark in the blank for each animal that you see on the nature hike. Add up the total number of animals that you see. Write that number on the animal face below.

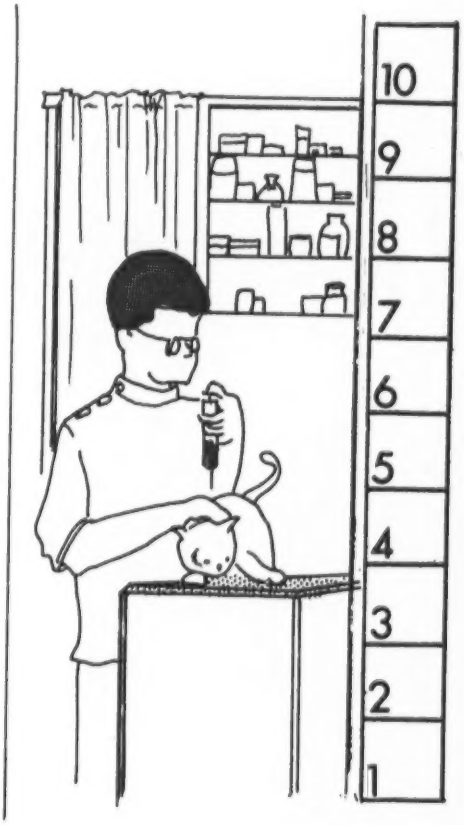
___ spider
___ crawdad
___ daddy longlegs
___ water strider
___ chipmunk
___ mole
___ fox
___ dragonfly
___ squirrel
___ deer
___ butterfly
___ tadpole
___ worm
___ raccoon
___ woodchuck
___ ladybug
___ snake
___ snail
___ millipede
___ toad
___ skunk
___ frog
___ sow bug
___ rabbit

Others:

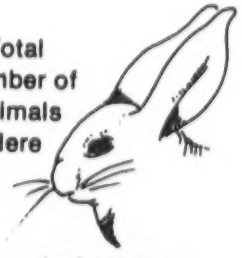
_____
_____
_____
_____

On a scale of 1 to 10 (1 being "for," 10 "against"), shade in the box on the drawing that best tells how you feel about the use of animals in experiments as described in this sentence:

"Scientists should be allowed to perform experiments on animals."



Total Number of Animals Here



(animal face)

How do you feel about the message seen on this bumper sticker? **21A**

ROAMING PETS CAUSE REGRETS

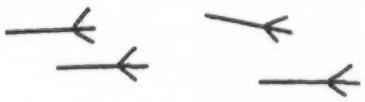
On a scale of 1 to 10, (1 being "for," 10 "against") shade in the box below that best tells how you feel about this animal message: "If youngsters allow their pets to roam, then other youngsters who find the pets should be allowed to keep them."

FOR 1 2 3 4 5 6 7 8 9 10 AGAINST

Ask your teacher/parents for answer card **21B.** Check your answer. Glue or tape answer card **21B** to back of question card **21A.** Save cards. Make a deck of question/answer cards of nature activities.

Tracks in Nature Lead To . . .

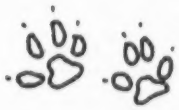
In the blank below each track pattern, write the name of the animal that made that track. In the parentheses ( ), print a "W" or "J" to tell whether those animals "walk" or "jump" when they make their tracks.



1. _____ ( )

2. _____ ( )

3. _____ ( )

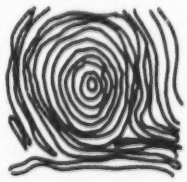


5. _____ ( )

4. _____ ( )

6. _____ ( )

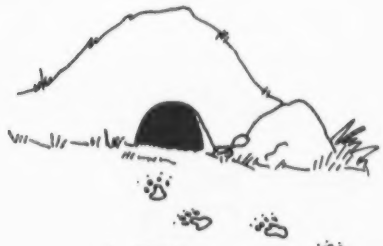
What is this track? **22A**



Ask your teacher/parents for answer card **22B.** Check your answer. Glue or tape answer card **22B** to back of question card **22A.** Save cards. Make a deck of question/answer cards of nature activities.

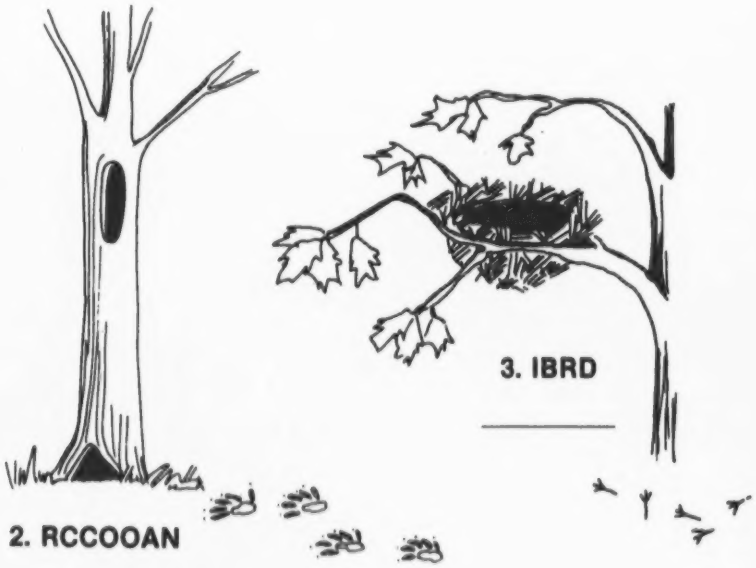
Homes in Nature

Unscramble the letters below each home found in nature to find out which one of nature's creatures lives in that home. Then, in the blank, write the name of the creature who lives in that home.



1. FXO

_____

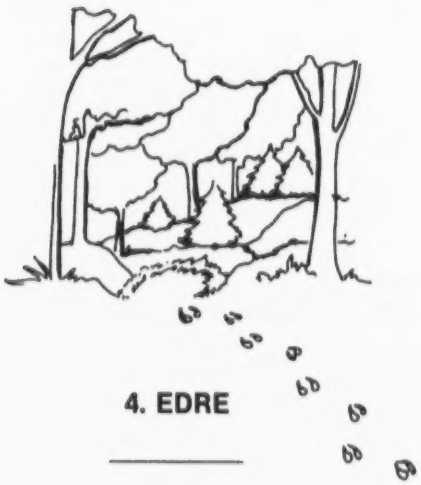


2. RCCOOAN

_____

3. IBRD

_____



4. EDRE

_____

5. ARBTBI

_____

6. OGD

_____

What animal lives in this home? **23A**

Ask your teacher/parents for answer card **23B**. Check your answer. Glue or tape answer card **23B** to back of question card **23A**. Save cards. Make a deck of question/answer cards of nature activities.

A Bonus Award for Nature's Detective

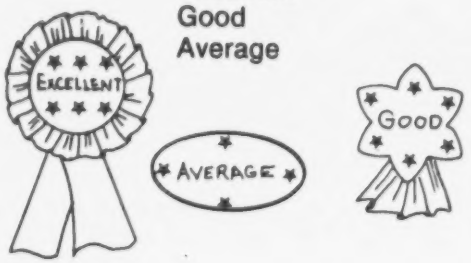
Become a detective in nature by finding and circling the items listed below. In the blank write the number of points for each item found. NOTE: You can use each item only once for maximum points. Add up the total number of points. RECORD. Then, find out if you are an excellent (74-94), good (60-73) or average (less than 60) detective in nature. Cut out and color your award found below. TIP: Be sure to get permission from the ranger, your teacher or parents before collecting each item.

Item	Point Value
1. Feather	5 ___
2. Acorn	2 ___
3. Wild flower	4 ___
4. Rock that contains two different kinds of materials	4 ___
5. Mushroom	2 ___
6. Fern	2 ___
7. Maple leaf	2 ___
8. Evidence of a litter bug	5 ___
9. Cattail	2 ___
10. Pine needle	1 ___
11. Charred wood	3 ___
12. Evidence that a predator has been at work	6 ___
13. A bone of some type	4 ___
14. Pinecone	1 ___
15. Oak leaf	1 ___
16. Burr	2 ___
17. Frog or toad	5 ___
18. A cocoon	5 ___
19. Piece of straw	3 ___
20. A clover leaf	2 ___
21. A twig with a bud	3 ___
22. Thorn	2 ___

Item	Point Value
23. Evidence that an insect has been at work	3 ___
24. Two seeds that travel	2 ___
25. Something used to make a nest	2 ___
26. Drawing of an animal track	3 ___
27. Geometric pattern in nature	2 ___
28. Two plants that need each other to live	6 ___

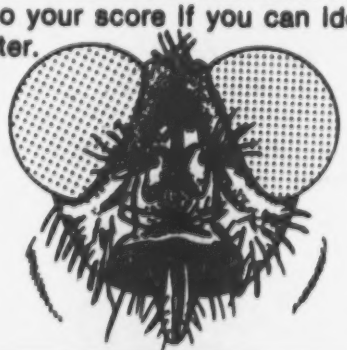
Total Maximum Points	84
Total Bonus Points (card 24A)	10
My Total Points Earned	___
My Detective Rank	___

Excellent
Good
Average



24A

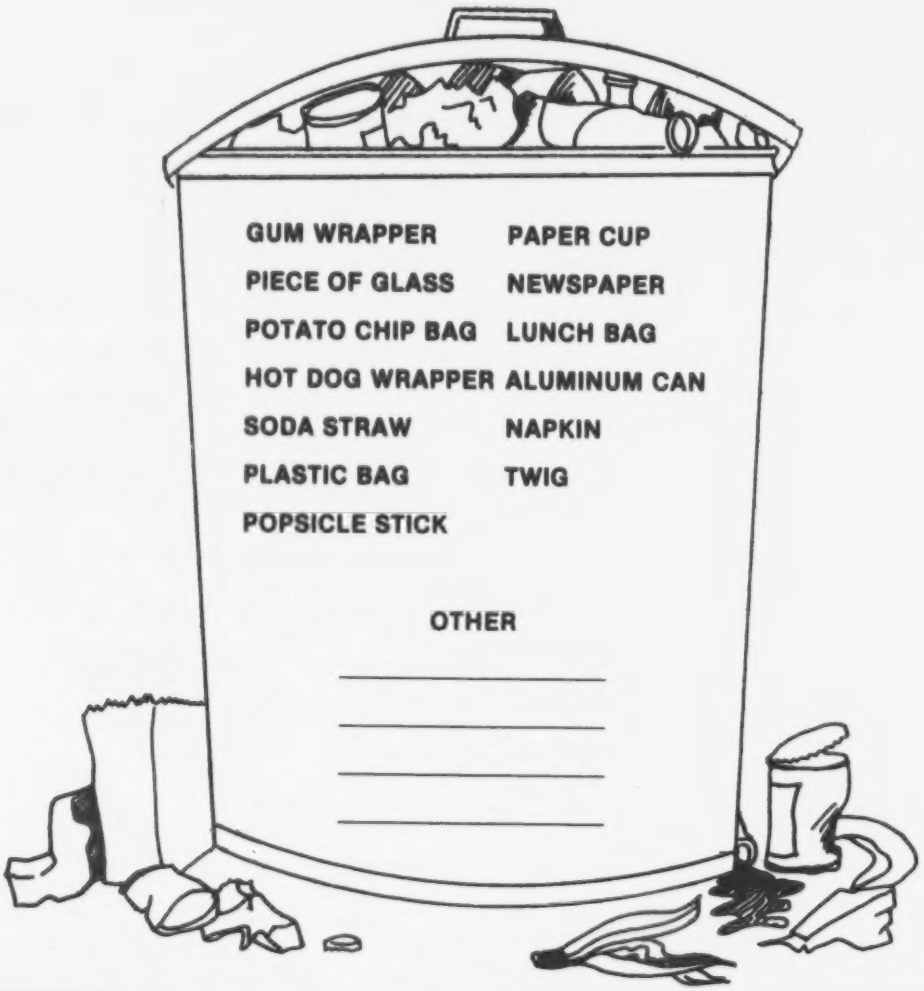
What is this microscopic object found as part of one of nature's creatures? Add 10 points to your score if you can identify this critter.



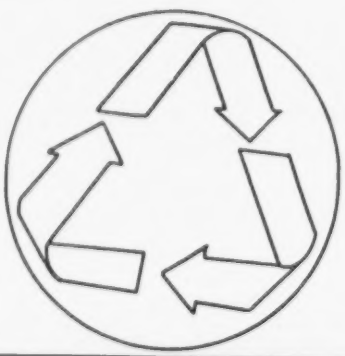
Ask your teacher/parents for answer card **24B**. Check your answer. Glue or tape answer card **24B** to back of question card **24A**. Save cards. Make a deck of question answer cards of nature activities.

LITTER IN NATURE

While on your nature hike, pick up litter to keep the environment beautiful. Every piece of litter picked up and placed in a trash can helps keep the environment clean and beautiful. On the trash can below, circle the name of each piece of litter that you found and placed in the the trash can while on your hike. Quietly think about how litter gets into the environment. Then, write a story about how you plan to prevent the spread of litter in your environment.



What is this symbol? **25A**



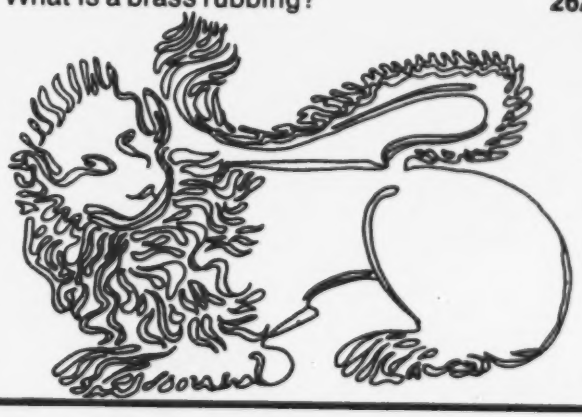
Ask your teacher/parents for answer card **25B.** Check your answer. Glue or tape answer card **25B** to back of question card **25A.** Save cards. Make a deck of question/answer cards of nature activities.

Tree Bark Rubbing

Make a record of one of nature's interesting designs found in the bark of trees. Place this paper over tree bark. Gently rub flat side of pencil or black crayon back and forth over tree bark. Observe its interesting patterns. Then, try to identify the tree from which you made this rubbing. Write its name in the blank above the rubbing. Try other rubbings. How are they the same? How are they different?

NAME OF TREE _____

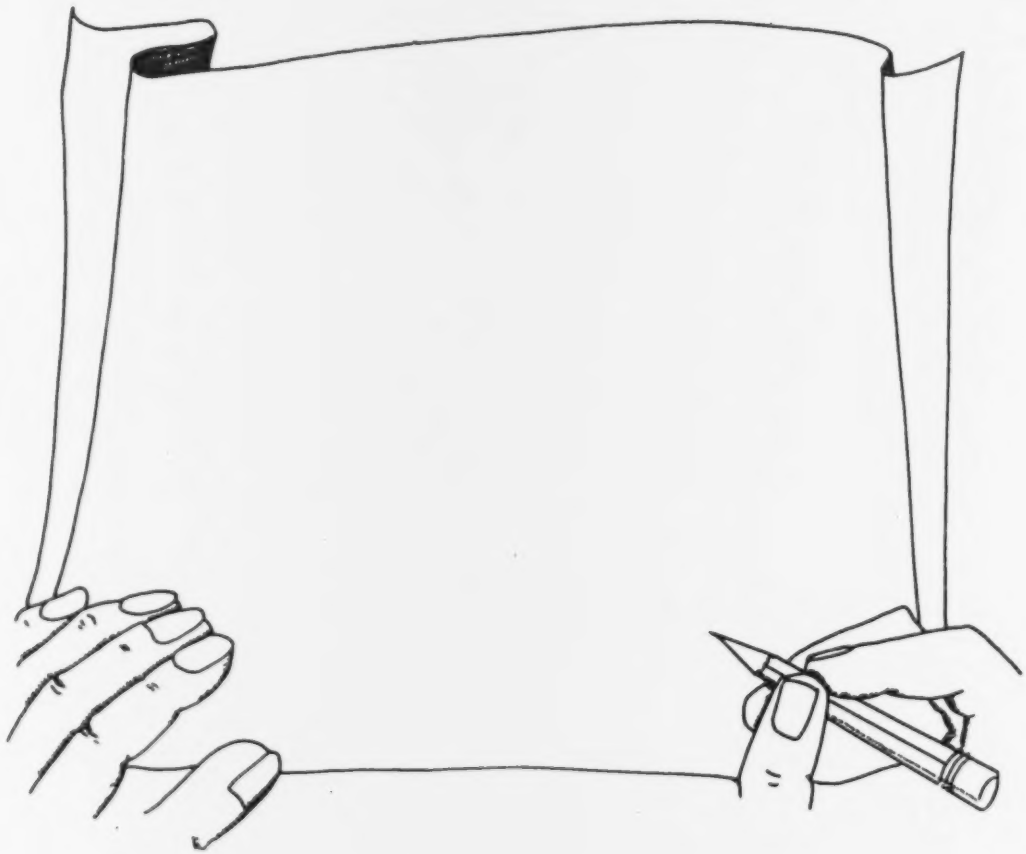
What is a brass rubbing? **26A**



Ask your teacher/parents for answer card **26B.** Check your answer. Glue or tape answer card **26B** to back of question card **26A.** Save cards. Make a deck of question/answer cards of nature activities.

An Ending, a Beginning: Thoughts and Feelings About Nature

Write a little log below in which you share your thoughts and feelings about nature.



You have now completed your nature hike. How do you feel about the message spotted on this bumper sticker? **27A**

I TOOK A STAND TO SAVE THE LAND

On a scale of 1 to 10 (1 being "for," 10 "against"), color in the box that best tells how you feel about the message on the bumper sticker above.

FOR									AGAINST
1	2	3	4	5	6	7	8	9	10

Ask your teacher/parents for answer card **27B.** Check your answer. Glue or tape answer card **27B** to back of question card **27A.** Save cards. Make a deck of question/answer cards of nature activities.

Answer Cards: **(Glue or tape to back of question card.)**

A **compass** is an instrument that helps you determine directions. Having a magnetic needle mounted on a pivot, the compass helps people find their way when they are lost or when there are no familiar landmarks to guide them. The magnetic needle on a compass always points to the north magnetic pole. Find out the difference between north magnetic pole and true North Pole. Then, find the four cardinal (N, S, E, W) and four intercardinal (NE, SE, SW, NW) points on a compass. **4B**

This symbol is a public sign for first aid. Items included in a nature hike first aid kit are Band-Aids, gauze, insect repellent, bee sting relief lotion, snake bite kit, bandage compresses, triangular bandages and Merthiolate swabs. Be sure to color the cross on card 5A red. **5B**

Yes, in fact scientists have now identified at least 17 senses. You can extend your five senses by doing this activity on your nature hike. Collect a rock or leaf and place it on a white sheet of paper or cardboard. Stare at the white paper or cardboard slightly above the rock or leaf for 45 seconds. Write a story about what you see around the edge of the rock or leaf. After staring, you can also shift your eyes to another piece of white paper or cardboard. Describe the colors you see. **6B**

(1) Poison Oak **7B**
(2) Poison Sumac
(3) Poison Sumac Berries
(4) Poison Ivy
(5) Stinging Nettle
(6) Jimson Weed

Always Remember: "Leaflets three, let it be; berries white, stay out of sight."

Answers: Cross section of a tree. You can tell the age of a tree by counting its rings, one ring per year of growth. Find out if this tree is older or younger than you. Then, identify the outer bark, sapwood, heartwood, cork, xylem, phloem and cambium in this tree. **8B**

Stonehenge, located on the Salisbury Plain in England, is a prehistoric monument made up of circles of stones. Being over 2,000 years old, Stonehenge acted as a prehistoric observatory where one could keep track of the movements of the sun and moon and thus predict the solstices and lunar eclipses. Find out what the words *solstice*, *eclipse* and *equinox* mean. Then, make a record when the vernal (spring) and autumnal (fall) equinoxes occur along with the summer and winter solstices. Find out what causes lunar and solar eclipses. **9B**

Answers: **10B**

Sunny and Clear
Partly Cloudy
Cloudy
Rainy
Snowy
Windy

Beaufort Scale for Wind Speed **11B**

Wind	Symbol	Speed MPH	Beaufort #	Wind Effects
Calm		<1	0	Smoke Rises Vertically
Light Breeze		4-7	2	Leaves Rustle
Fresh Breeze		19-20	5	Small Trees Sway
Strong Breeze		25-31	6	Large Branches Move

Acid clouds are clouds that contain acid caused by the burning of fossil fuels such as coal. Acid rain is dangerous to our environment because it can kill many plants and animals such as trees and fish. **12B**

You should see a reddish-pink colored leaf that represents a change in color in the leaf during fall. The leaf is from a maple tree. **13B**

mm
cm
dm
m
dkm
hm
km

Using the metric ruler found on card 14A, find a twig on the ground whose length is exactly eight centimeters. **14B**

Tenants. Make your own mind bender and draw it here. **15B**

The son replies, "I talk to the wet moss in nature because the moss never tells." Write a story or poem about what you do when you are faced with one of life's challenges. **16B**

Generally, humans cannot hear anything vibrating over 20,000 times per second. Dogs, however, can hear sounds in this range. Similarly, humans cannot hear below 20 cycles per second. Investigate how a dog whistle operates and how a dog can hear sounds that humans cannot hear. **17B**

Maple Seed. By studying the flight pattern of a maple seed, scientists invented the helicopter. You can do the same by making your own helicopter.
In the model on page 18, cut slots D, E and F. Fold flaps A and C over flap B. Add paper clip. Hold overhead by grasping point X. Boost helicopter into air. Note direction of spin. Time how long it takes to land. Bend blades A and B in opposite directions. Note direction of spin. Add more paper clips. Time rate of descent for each trial. **18B**

The water cycle is an unending cycle that features water constantly on the move. The sun warms the surface of the earth changing water into invisible vapor (evaporation). In the air, this invisible vapor condenses and forms many droplets that make up clouds (condensation). Soon thereafter the moisture in the clouds returns to the earth as rain and snow (precipitation). Connect the dots in the picture on card 19A to show the path taken by water in the water cycle. **19B**

In the fall, leaves become sealed off from the rest of the tree. Falling temperatures and the shorter days cut the tree off from getting nutrients and moisture. Green chlorophyll, which helps the tree make food, is no longer made. As green chlorophyll fades, yellow and orange pigments which were hidden by the green chlorophyll come into view in the fall. The leaf's attachment to the twig becomes weaker in the fall, and the leaf falls to the ground. **20B**

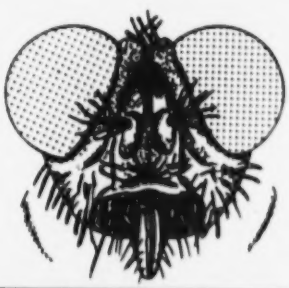
Answers will vary. **21B**

Design your own animal bumper sticker here. Be sure you agree with its message.

This is a picture of a human fingerprint. Find out whether the fingerprint is classified as a loop, whorl, arch or composite fingerprint. Then, find out the type of fingerprint you have. You can do this with a pencil. Rub pencil over paper. Place finger over smudge mark made by pencil. Remove finger. Touch finger to clean sheet of white paper. You will then see your own fingerprint on the paper. **22B**

Shown in this picture is the beaver's dam, lodge, and pile of stored food. The lodge is made up of branches and sticks plastered with mud that, when frozen in winter, makes up a solid wall. The beaver's lodge has a built-in ventilation area on top. The beaver swims under the ice in winter to branches nearby to feed. Underwater entrances lead to the lodge. On a separate piece of paper, make a sketch of a floor plan of your own home. Compare to home of a beaver. **23B**

This is a microscopic view of the common housefly. *Bonus:* Add 10 points to your score if you identified this creature correctly. **24B**



This is a symbol that stands for "recycling." Locate your nearest recycling station. Fill in the blanks below. **25B**

MY RECYCLING CENTER'S NAME IS:

_____

PHONE NUMBER IS:

_____

ADDRESS IS:

_____

_____

PRICES PAID FOR:

ALUMINUM CANS:

_____¢ PER LB.

PAPER:

_____¢ PER LB.

GLASS:

_____¢ PER LB.

Brasses have been made since medieval times. They were used to commemorate the people they illustrate. The original brasses are found set into the floors of churches and cathedrals. Brasses have taught us much about the development of costume and armour. Brass rubbing is a simple and attractive way of recording designs and has become a popular hobby. Make a pattern out of coins and try rubbing them. You can use kitchen foil instead of paper and a handerchief instead of wax. Merely place foil on penny. Place handerchief over foil. Rub thumb over handerchief to make the design. **26B**

Answers will vary. How do you feel about nature's message found on this postage stamp? **27B**

On a scale of 1-10 (1 being "for," 10 "against"), color in the box that best tells how you feel about nature and its creatures.

FOR AGAINST

[1] [2] [3] [4] [5] [6] [7] [8] [9] [10]

TEACHER/PARENT GUIDE

MY SUMMER EXPERIENCES WITH NATURE
(front cover)

Activity Page Number 2

Tip: Have youngsters cut activity sheet into designated 16 squares. Rearrange puzzle pieces to make complete picture. Glue pieces in place onto cardboard (back of writing tablets) or tagboard. Add name of student. Color. Decorate. Use as front cover for Student's Book. Discuss what one may see on a summer nature hike. Duplicate page 3 for back cover of Student's Book. Follow same procedure. Add name of school. Discuss what one may find on a winter nature hike. Laminate both covers. Tape front cover to back cover and use as a folder for pages to make a complete Nature Hike Sketch Pad and Student Book. Youngsters can also use a file folder or a 3-ring binder for this purpose.

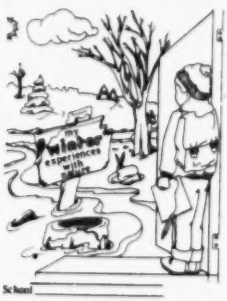
Answers: Completed project looks like this:

MY WINTER EXPERIENCES WITH NATURE
(back cover)

Activity Page Number 3

Tip: See procedure for Activity Page Number 2.

Answers: Completed project should look like this:



FOLLOW DIRECTIONS

Activity Page Number 4

Tip: A rubber band stretched around a sketch pad can be used to keep pages in place.

Note: Not all pages in the book need to be attached and used on one nature hike at one time. An extending activity card is found at the bottom of each activity page, the matching answer card in the back of the book on pages 28-30. These cards feature extending activities related to the activity on the page. Have youngsters cut out these cards and glue "B" lettered card (answer card) to the **back** of "A" lettered card (question card). The cards can then be laminated for lasting use.

Answer: Completed sketch pad.

NATURE HIKE STUDY KIT

Activity Page Number 5

Tip: Remind youngsters that not all items need to be collected before one can begin a hike; rather, suggested items make a nature hike go more smoothly. Do not use ball point pens in winter time; crayons are more effective. Remind youngsters that the symbol for first aid is red and should be colored red.

Answers: Group A—All SW except for ball-point pen which is a summer instrument. **Group B** —All SW except hot chocolate (W), insect repellent(S) and ice (S). **Group C**—All SW except snowsuit (W), layered clothes (W), long underwear (W), warm socks (W), mittens (W), and sun cap (S).

TIPS ON TAKING A HIKE

Activity Page Number 6

Tip: Emphasize that youngsters should never eat any wild foods while on a hike. (1) eye, (2) ear, (3) nose, (4) tongue, (5) hand. Numerals should be written on the correct body parts.

BE AWARE OF NATURE'S SPECIAL SAFETY AIDS

Activity Page Number 7

Tip: Be sure that youngsters are aware of all safety precautions **before** going on the hike.

Answers: All acorns are (⌣).

GETTING STARTED WITH . . .

Activity Page Number 8

Tip: Be sure youngsters draw in clock hands to show beginning and ending times of hike. Carry a wristwatch to keep record of time. A whistle or bell can be used to notify youngsters of sightings, events and finish time.

Answers: Answers will vary.

THE SUN

Activity Page Number 9

Tip: Never allow youngsters to look directly at the sun. Adding machine tape can be used to make a graphic representation of the length of the sun's shadow.

Answers: Answers will vary, but sun's shadow is longer in early morning and late afternoon, shorter at noon.

THE WEATHER

Activity Page Number 10

Tip: Have youngsters observe the sky and weather carefully throughout the hike. After the hike, have youngsters cut out the weather map from the newspaper, identify weather symbols and attach to sheet of paper.

Answers: Answers will vary.

WIND AND TEMPERATURE

Activity Page Number 11

Tip: Use crayons or pencils in winter, felt-tipped or ball-point pens in summer. For further weather activities, see *Young Scientists Explore the Weather*, Good Apple, Inc., 1983.

Answers: Answers will vary.

THE CLOUDS

Activity Page Number 12

Tip: A useful reference book for the study of clouds is *Cloud Studies in Colour* by Richard Scorer and Henry Wepler.

Answers: (1) Cirrus, (2) Cumulus, (3) Nimbus, (4) Stratus.

NATURE'S COLORS

Activity Page Number 13

Tip: Remind youngsters to color lightly over the names of objects with matching colors. For background information on extending activity, read *The Kirlian Aura* by Stanley Krippner or have youngsters study KIRLIAN photography. Discuss function of rods (black and white vision) and cones (color vision) in eyes.

Answers: Answers will vary.

NATURE'S MEASUREMENTS

Activity Page Number 14

Tip: Youngsters should be encouraged to use both English (customary) and metric equivalent measurements while doing the activity twice.

Answers: Answers will vary.

STAKE YOUR MICRO-CLAIM TO NATURE

Activity Page Number 15

Tip: Have children add various living and nonliving creatures to their squares after completing the initial activity. Popsicle sticks work well for the sticks. They also can be used as small trowels for digging.

Answers: Answers will vary.

COMMUNICATING WITH NATURE

Activity Page Number 16

Tip: Have youngsters become aware of different types of communication. Emphasize nonverbal communication between nature's creatures.

Answers: Answers will vary.

LISTENING TO NATURE

Activity Page Number 17

Tip: Remind youngsters that their ability to hear is heightened when their eyes are closed, such as the case of a person who is blind. Have youngsters compare the snap of a twig with eyes open, then eyes closed.

Answers: Answers will vary.

NATURE'S INVENTIONS

Activity Page Number 18

Tip: Introduce activity with a discussion of various frog jumping contests and other such events. Point out how humans have developed many activities and inventions by close observation of nature's creatures.

Answers: 1. B, 2. A, 3. F, 4. H, 5. I, 6. D, 7. J, 8. E, 9. G, 10. C. Instructions for helicopter activity are found on card 18B on page 29.

NATURE'S CYCLES

Activity Page Number 19

Tip: Discuss how youngsters, like all creatures in nature, grow from birth to death in a cyclical pattern. Youngsters may want to make a set of sequence cards from photographs that show their own growth and development.

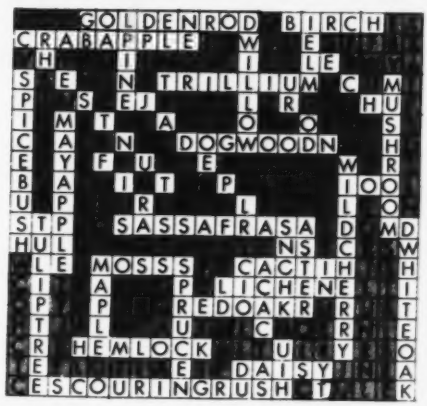
Answers: Frog: B = 1, D = 2, A = 3, C = 4; Butterfly: H = 1, F = 2, G = 3, E = 4.

TREES, FLOWERS AND OTHER PLANTS

Activity Page Number 20

Tip: Encourage youngsters to make drawings of trees, flowers and plants that they see even though they may not know the actual names of these objects.

Answers: Completed puzzle should look like this:


GOLDENROD BIRCH
CRABAPPLE WE
H I I LE
SE N TRILLIUM C M
P S EJ L R HU
I M T A O O S
C A N DOGWOODN H
E Y F U E W R
B A I T P IOO
U P R L L O
STP SASSAFRASA D MD
HUL NS C W
LE MOSSS CACTIH H
I A P LICHENE I
P P REDOAKR R T
T L U C R E
R HEMLOCK U Y O
E E DAISY A
ESCOURINGRUSH T K

ANIMAL CREATURES

Activity Page Number 21

Tip: Discuss how various animal creatures are difficult to see due to their color and the foliage around them. Encourage youngsters to locate as many creatures as possible but to leave them alone in their natural environment. For further animal activities, see *Young Scientists Explore Animals*, Good Apple, Inc., 1982.

TRACKS IN NATURE LEAD TO . . .

Activity Page Number 22

Tip: Have youngsters look at their thumbprints and classify as loop, whorl, arch or composite. Use as sample track for track activity in nature.

Answers: 1. Bird (J), 2. Rabbit (J), 3. Deer (W), 4. Raccoon (W), 5. Fox (W), 6. Dog (W).

HOMES IN NATURE

Activity Page Number 23

Tip: Introduce activity with a discussion of the types of homes youngsters live in and the features found in each, for example, heating and ventilation systems. Compare to animal homes.

Answers: 1. Fox, 2. Raccoon, 3. Bird, 4. Deer, 5. Rabbit, 6. Dog.

A BONUS AWARD FOR NATURE'S DETECTIVE

Activity Page Number 24

Tip: Stress the importance of obtaining proper permission before collecting any object from its natural environment. Limit maximum number of points per item to a single item only. For example, a feather is worth 5 points; two feathers would still be worth 5 points, not 10 points. Total maximum points could increase from 84 to 94 with correct identification of creature on card 24A.

Answers: Answers will vary.

LITTER IN NATURE

Activity Page Number 25

Tip: As an extending activity, have youngsters classify, then weigh, litter found in one container of trash.

Answers: Answers will vary.

TREE BARK RUBBING

Activity Page Number 26

Tip: Introduce activity with a practice rubbing. Place paper over sandpaper. Rub pencil over paper to make textured design. Then, do tree bark rubbing.

Answers: Answers will vary.

AN ENDING, A BEGINNING: THOUGHTS AND FEELINGS ABOUT NATURE

Activity Page Number 27

Tip: Encourage youngsters to keep daily logs of their experiences with nature. Multiple copies of this page can be used to further enhance this activity.

Answers: Answers will vary.

END

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